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adcacqlogicv38.vhd
XFER_FSM : process (SYSCLK, RESET)
begin
if(RESET = '1') then
    dixer <= '0';
    pipeline_go <= '0';
    AcqRstRegFile <= '0';
    WrtAdcRegFile <= '0';
    XferClkEnable <= "00";
    BUS_BUSY_OUT <= '0';
    fsm_state <= "000";
    Blog <= '0';
    ctc_detect <= '0';
    DataXferState <= XferIdle;
elsif(rising_edge(SYSCLK)) then
    case DataXferState is
        when XferIdle =>
            fsm_state <= "000";
            pipeline_go <= '0';
            BUS_BUSY_OUT <= '0';
            -- ALLOW TRANSACTIONS ON THE CPLD DATA PORT.
            if (DATA_COUNT_IN > "0001") then
                Blog <= '1';
            end if;
            if (loc_busy = '1') then
                DataXferState <= XferWait4Eoc;
                busy_cnt <= (others >= '0');
                ctc_detect <= '1';
            else
                DataXferState <= XferIdle;
            end if;
        when XferWait4Eoc =>
            fsm_state <= "001";
            ctc_detect <= '0';
            if (busy_cnt = BUSY_TIMEOUT) then
                -- Wait 2.25 us and then
                XferClkEnable <= "01";
                -- Force the acquisition of data from the CPLD
                DataXferState <= XferGo;
                -- which should happen if ADCs are powered down
            elsif(loc_busy = '0') then
                -- Otherwise, if there is at least one ADC powered up
                if (BUS_BUSY_IN = '0') then
                    -- FIRST TEST THE BUS TO SEE IF BUSY
                    XferClkEnable <= "01";
                    -- ENABLE CLOCK ON FIRST CPLD
                DataXferState <= XferGo;
            else
                busy_cnt <= busy_cnt + 1;
                DataXferState <= XferWait4Eoc;
            end if;
        else
            busy_cnt <= busy_cnt + 1;
            -- Increment the timeout counter
            DataXferState <= XferWait4Eoc;
        end if;
        when XferGo =>
            if (BUS_BUSY_IN = '0') then
                fsm_state <= "011";
                dixer <= '1';
                AcqRstRegFile <= '1';
                BUS_BUSY_OUT <= '1';
                DataXferState <= XferBegin;
            else
                DataXferState <= XferGo;
            end if;
        when XferBegin =>
            fsm_state <= "100";
            dixer <= '0';
            AcqRstRegFile <= '0';
            WrtAdcRegFile <= '1';
            WrtCntr <= '0';
            DataXferState <= XferWrite;
        when XferWrite =>
            fsm_state <= "101";
            if (WrtCntr = '0') then
                WrtCntr <= '1';
                DataXferState <= XferWrite;
            else
                WrtAdcRegFile <= '0';
                -- Shut down the write strobe to the ram store.
                DataXferState <= XferChngCpld;
            end if;
        when XferChngCpld =>
            fsm_state <= "110";
            if(XferClkEnable = "01") then
                XferClkEnable <= "10";
                -- Disable last and enable next CPLD via the clock line
                dixer <= '1';
                DataXferState <= XferBegin;
            else
                -- DATS ALL FOLKS !!
                if(PIPELINE_ACTIVE = '1' and loc_pipe_enbl = '1') then
                    pipeline_go <= '1';
                    -- Do the pipeline work if enabled and allowed
                end if;
                XferClkEnable <= (others >= '0');
                -- SHUT DOWN THE CLOCKS TO CPLD'S
                Blog <= not Blog;
                DataXferState <= XferIdle;
            end if;
        when others =>
            fsm_state <= "111";
            DataXferState <= XferIdle;
    end case;
end if;

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